

APPENDIX A
More About the South Dakota Science Revision Committee Members

Mary E. Ball, 7th - 8th Grade Science Educator, Sioux Falls School District 49-5
District Science Curriculum Member

Barbara Boone-Graves, 7th Grade Science Teacher, Sioux Falls School District 49-5
National Science Teachers' Association, Member
South Dakota Science Teachers' Association, Member
District Science Curriculum, Member
NASA NEW Teacher, 2002

Christina F. Bosse, High School Science Teacher, Langford School District 45-2
South Dakota Science Teachers' Association, Member

Sara Bradfeldt-Waring, Bilingual Grant Coordinator, Sioux Falls School District 49-5
Dakota TESL President
National TESOL Member

Janet Briggs, Center for the Advancement of Math and Science Education, Black Hills
State University
NSF Grant Manager and Science Outreach Coordinator

Carolyn Burns, High School Science Instructor, Watertown School District 14-4
Adjunct Professor, Mt. Marty College, Watertown Branch
South Dakota Science Teachers' Association, President 1998 - 2000
South Dakota Science Teachers' Association, Distinguished Service Award, 2000
South Dakota Academy of Science, Physical Science Teacher of the Year, 1999

Karen Byrd, Kindergarten Teacher, Kadoka Elementary School, Kakoka School District
35-1
K-12 Gifted Endorsement
Black Hills Science Teacher, Member
Outstanding Community Service Award (Masonic)
Service to Community Youth Award (Lions)
Teacher of the Year Nominee

Faydra Christensen, 4th Grade Teacher, Webster Elementary, Yankton School District
63-3
South Dakota Science Teachers' Association, Member
Delta Kappa Gamma
Who's Who Among American Teachers
Yankton Education Association/South Dakota Education Association Member
Yankton Reading Council

Science Curriculum Committee
District Wide Technology Committee

Kathy Christensen, 4th Grade Teacher, East Elementary, Spearfish School District 40-2
Master's Degree in Curriculum and Instruction in May 2003
Participated in the Fulbright Memorial Fund Master Teacher Program, 1999-2003
Active committee member of the K-12 Science Curriculum, 1975-Present
1996 Presidential Award for Excellence in Science
Spearfish Education Association/South Dakota Education Association Member
Lookout Reading Council, Member
Queen City Literacy Council, Member
Kappa Delta Pi, Member
Delta Kappa Gamma, Member
Philanthropic Education Organization Chapter N, Member

RoseMary Christenson, 8th Grade Earth Science Teacher, Brandon Valley School District 49-2
Brandon Valley Middle School Science Chairperson
Brandon Valley Teacher of the Year 2001
Who's Who in American Education
National Science Teachers' Association
South Dakota Middle Level Association
New Teacher Mentor

Michele Cork, 8th Grade Science Teacher, Sioux Falls School District 49-5
District Science Curriculum Committee Member
Who's Who in American Education
National Science Teachers' Association, Member

Julie Dahl, Center for the Advancement of Math and Science Education, Black Hills State University

Gay DeJong, 7th Grade Science Teacher, Sioux Falls School District 49-5
South Dakota Science Teachers' Association, Member
National Science Teachers' Association, Member

Mark Emry, 6th Grade Science Teacher, Sioux Falls School District 49-5 National Science Teachers' Association, Member

Ronald Frary, High School Science Teacher, Chamberlain School District 07-1
Who's Who in American Education
South Dakota Science Teachers' Association, Member

Tricia Gainey, 4th Grade Classroom Teacher, Meade School District 46-1
Northern Hills Reading Council, President
District Science Curriculum, Member

District Science Textbook Selection Committee
Black Hills Science Teacher (BLAHST), Member

Jon Gonsor, Science Instructor, T.F. Riggs High School, Pierre School District 32-2
National Honor Society “Teacher of the Year,” T.F. Riggs High School
Pierre School District Professional Development Committee
Past President South Dakota Science Teachers’ Association
Past Secretary South Dakota Science Teachers’ Association
South Dakota Science Teachers’ Association Service Award
Tandy Technology Scholars Outstanding Teacher
National Science Teachers’ Association, Midwestern Area Convention Program
Chairman
Who's Who In American Education
Past President Pierre Educational Association
Teacher of the Year Salem School District

Ken Graupmann, Science Teacher, Kadoka School District 35-1
Past President South Dakota Science Teachers’ Association
Past President South Dakota Ornithologist Union
Past Chairman and Present Vice-chairman of the Jackson County Conservation District
1999 Estes/NSTA Space Teacher of the Year
South Dakota Science Teachers’ Association
South Dakota Council of Teachers of Math
National Middle Level Science Teachers’ Association
National Earth Science Teachers’ Association
The Geological Society of America
The American Meteorological Society
National Science Teachers’ Association, Middle Level Science Committee
National Science Teachers’ Association, Science Scope Advisory Board and Manuscript
Reviewer

Linda Heeren, 2nd Grade Teacher, Brandon Valley School District 49-2
Teacher of the Year Nominee, 1997 and 2001
New Teacher Mentor
Disney Hand Teacher Award Nominee, 2004-2005

Vennie Heibel, 8th Grade Science Teacher, Pierre Schools 32-2
Qwest Technology in Education Award Winner
South Dakota Science Teachers’ Association, Presenter and Member
National Science Teachers’ Association, Presenter and Member
Midwest Middle Level Educators’ Association, Presenter and Member
District Curriculum Committee Member
District Staff Development Committee Member

Linda Johnson, 3rd – 4th Grade Special Education Teacher, Meade School District 46-1
District Special Education Curriculum Committee Member

Northern Hills Reading Council Chairperson
Who's Who in American Education

Donna Juffer-Williams, 7th Grade Life Science Instructor, Brandon Valley School District 49-2
Teacher of the Year Nominee, Brandon Valley School District
District Science Curriculum Member
New Teacher Mentor
South Dakota Science Teachers' Association, Member
National Science Teachers' Association, Member

Arne Lund, High School Science Teacher, Kadoka High School 35-1
South Dakota Science Teachers' Association, Member
Outstanding South Dakota Physical Science Teacher of the Year-2004
Capital Region Advisor for South Dakota Student Council Association
Student Council State Board-Advisors Representative-SDHSAA
Who's Who Among America's Teachers, Multiple Award Winner

Ramona Lundberg, 10th -12th Grade Science Teacher, Deuel School District 19-4
Presidential Award for Excellence in Mathematics and Science Teaching, 7-12 Science 2000
South Dakota Physical Science Teacher of the Year 2002
South Dakota Science Teachers' Association, Secretary 2002-present
South Dakota State Coordinator for Presidential Awards for Excellence in Science Teaching
National Science Education Leadership Association, Member

Jan Martin, Coordinator of Assessment and Evaluation, Todd County School District 66-1
National Science Teachers' Association, Member
American Educational Research Association, Member
Outstanding Research Paper, American Educational Research Association

Anita Miller, Middle School Science Teacher, Rapid City School District 51-4
District Science Curriculum
Revision Committee Member
National Science Teachers' Association, Member

Deb Nafziger, 6th Grade Teacher, Agar-Blunt-Onida School District 58-3

Sandy Nichols, 3rd Grade Teacher, Spearfish School District 40-2
2000 Spearfish Teacher of the Year
Who's Who Among America's Teachers
Master's Degree in Curriculum and Instruction 2002
Fulbright Memorial Fund Master Teacher Program 2002
District Science Curriculum Member

Linda O'Donnell, 7th – 8th Grade English and Science Teacher, 7th Grade Math Teacher,
Lemmon School District 52-2
South Dakota Honored Women Educators, Member
South Dakota Science Teachers' Association, Member

Dr. Ben Sayler, Associate Professor of Physical Science and Mathematics and Director
of the Center for the Advancement of Mathematics and Science Education, Black Hills
State University.

Eileen Skyberg, 4th Grade Teacher, Brandon Valley School District 49–2
District Science Curriculum Member
Teacher of the Year Nominee
Who's Who in American Education

Cassie Soeffing, 6th Grade Classroom Teacher, Sioux Falls School District 49-5
District Science Curriculum Committee, Member
South Dakota Science Teachers' Association, Member
2004 Nominee for Presidential Award for Excellence in Mathematics and Science
Teaching
2004 Bush Leadership Fellows program. Finalist.
2003, 2004 NASA Space Grant Fellow (SDSM&T)
2002 Toyota TAPESTRY Ambassador
2001 Eleanor Roosevelt Teacher Fellowship, American Association of University
Women
2001 Toyota TAPESTRY
1998 Christa McAuliffe Fellowship, Council of Chief State School Officers
1997-2004 USGS EROS Data Center-Teacher Intern
1997 Pilot Teacher for (Upper Midwest Aerospace Consortium/Education Public Access
Resource Center)
1996 US West Connecting Teachers with Technology Award

William Soeffing, PhD, Professor, Biology, University of Sioux Falls

James Stearns, High School Science, Math, and Computer Teacher, Groton Area School
District 6-6
South Dakota Council of Teachers of Math, Member
South Dakota Science Teachers' Association, Member
South Dakota Science Teachers' Association, Newsletter, Co-editor
National Science Teachers' Association, Member

Sharla Steever, 3rd Grade Teacher, Hill City School District 51-2
National Board Certified Teacher in Middle Childhood (pending)
Mentor for teachers seeking National Board Certification
National Science Teachers' Association, Member
South Dakota Science Teachers' Association, Member

National Education Association, Member
South Dakota Education Association, Member

Sally Stoll, 7th Grade Science Teacher, Vermillion School District 13-1
2003 Presidential Award for Excellence in Mathematics and Science Teaching, 7-12
Science
National Science Teachers' Association, Member
South Dakota Science Teachers' Association, Member

Nancy Van Beek, Education Manager of the Washington Pavilion's Kirby Science
Discovery Center
Iowa Department of Education Science Demonstration Site Teacher
Who's Who of American Teachers

Shirlee Weich, 2nd Grade Teacher, Plankinton School 1-1

Carolyn Westby, 1st - 3rd Grade Teacher, Holy Rosary School, Kranzburg, South Dakota

Pamela Zubke, 7th -12th Grade Science and Math Instructor, Waubay High School
South Dakota Science Teachers' Association, Newsletter Co-editor
National Science Teachers' Association, Member
District Curriculum Development Committee, Math Representative
Waubay Education Association, President

**APPENDIX B
RESOURCES REFERENCED
BY THE SOUTH DAKOTA SCIENCE CONTENT
STANDARDS REVISION COMMITTEE**

SD Content Standards for K-12 Science

South Dakota Science Standards, 1999

Other State Content Standards for K-12 Science

California State Science Content Standards: <http://www.cde.ca.gov/be/st/ss/scmain.asp>

Kentucky State Science Content Standards: <http://www.education.ky.gov>

Massachusetts State Science Content Standards:
<http://www.doe.mass.edu/frameworks/scitech/2001/>

Professional Publications

National Science Content Standards:
<http://www.nap.edu/readingroom/books/nse/html/6a.html>

Science Framework for the 1996 and 2000 National Assessment of Educational Progress. Washington, DC: National Assessment Governing Board. (2000)
<http://www.nagb.org/pubs/96-2000science/toc.html>

APPENDIX C

Annotated List of South Dakota Science Resources

South Dakota Agriculture in the Classroom. (2004) www.sdagclassroom.org.

South Dakota Agriculture in the Classroom strives to help teachers and students understand how food and fiber are produced and that agriculture has an essential role in maintaining a strong economy. Agriculture in the Classroom is a nationwide effort to integrate information about agriculture into existing elementary curriculum. In South Dakota, Agriculture in the Classroom is funded in part by the SD Department of Agriculture, support from state commodity groups, agribusinesses, and individuals, all committed to educating youth about South Dakota's #1 industry - agriculture. For more information contact South Dakota Agriculture in the Classroom at 1-800-573-2482, email sdagclassroom@iw.net.

Science Framework for the 1996 and 2000 National Assessment of Educational Progress. Washington, DC: National Assessment Governing Board. (2000) <http://www.nagb.org/pubs/96-2000science/toc.html>

This document contains the framework and rationale for assessing science achievement of students throughout the United States in 1996 and 2000. It provides a general overview of the National Assessment of Educational Progress (NAEP), describes the NAEP Science Framework adopted by the National Assessment Governing Board (NAGB), and reviews the process by which the Framework was developed.

National Science Education Standards. Washington, DC: National Academy of Sciences. (1996)

The National Science Education Standards present a vision of a scientifically literate populace. They outline what students need to know, understand, and be able to do to be scientifically literate at different grade levels. They describe an educational system in which all students demonstrate high levels of performance, in which teachers are empowered to make the decisions essential for effective learning, in which interlocking communities of teachers and students are focused on learning science, and in which supportive educational programs and systems nurture achievement. The *Standards* point toward a future that is challenging but attainable--which is why they are written in the present tense.

Benchmarks for Science Literacy. American Association for the Advancement of Science (AAAS) New York: Oxford University Press. (1994) <http://www.project2061.org/publications/bsl/default.htm>

Benchmarks for Science Literacy specifies how students should progress toward science literacy by outlining learning goals to be targeted at certain grade levels. These learning goals, or benchmarks, are statements of what all students should know or be able to do in science, mathematics, and technology by the end of grades 2, 5, 8, and 12.

Atlas of Science Literacy. American Association for the Advancement of Science (AAAS), New York: Oxford University Press, 1999.
<http://www.project2061.org/publications/atlas/default.htm>

AAAS Atlas for Science Literacy consists of 49 strand maps that describe a progression of ideas and skills. The maps are designed to show: 1) coherent patterns and connections among ideas and skills, 2) students' understanding over time that lead to science literacy, 3) reference for integrating topics in logical and useful ways, and 4) grade-level match for a more diagnostic approach of developing assessment items.

Making Sense of Secondary science: Research into Children's Ideas. Driver, R., Squires, A., Rushworth, P., & Wood-Robinson, V., London and New York: Routledge. (1994)

When children begin secondary school they already have knowledge and ideas about many aspects of the natural world from their experiences both in primary classes and outside school. These ideas contribute to subsequent learning and research has shown that teaching is unlikely to be effective unless it takes learners' perspectives into account.

Children's Ideas in Science. Driver, R., Guesne, E., and Tiberghien, A. (Eds.) Milton Keynes, United Kingdom: Open Press. (1995)

Many children have ideas/concepts that differ from standard accepted science. These concepts are often resistant to change and persist despite exposure through teaching to the 'correct' explanations. This book documents and explores the ideas of school students (aged 10-16) about a range of natural phenomena such as light, heat, force and motion, the structure of matter and electricity. It also examines how students' conceptions change and develop with teaching.

Vital Connections: Children, Science, and Books. Saul, W. and Jagusch, S.A. (Eds). Papers from a 1986 Symposium sponsored by the Children's Literature Center (Library of Congress). Portsmouth, NH: Heinemann. (1991)

Vital Connections is an outgrowth of a symposium sponsored by the Children's Literature Center of the Library of Congress to highlight issues surrounding the use of science trade books in classrooms and libraries. It includes essays for children by science writers, critical responses, and discussions of classroom and libraries, by editors, teachers, and educational researchers. The Authors section includes Patricia Lauber, Laurence Pringle, Seymour Simon, Vicki Cobb, Jean Craighead George, and Ira Flatow. One of the critical responses is an interview with Barbara Fenton, science book editor.

Taking the Plunge. How to Teach Primary Science More Effectively. Harlen, W. (Ed). Oxford: Heinemann Educational Books. (1998)

This book for primary teachers is designed to illustrate how they can teach science more effectively. Chapters deal with features of science instruction that are known to concern

many teachers. Topics include helping children make a start in primary school science; handling student questions; encouraging children to record their work; helping them to raise questions, to observe, to plan investigations, and to communicate; and taking into account children's own ideas.

The Teaching Of Science In Primary Schools (3rd Ed.) Harlen, W., London: David Foulton Publishers. (2000)

The overall aim of the book is to help teachers to develop children's understanding through enquiry. The topics covered include: how teachers can help children to construct ideas; the importance and meaning of progression in learning science; formative assessment as part of teaching and learning; the opportunities provided by using computers and ICT; making the best use of practical activities; the role of language and discussion; and the value of helping children to reflect on how they are approaching problems.

Teaching and Learning and Assessing Science 5–12 (3rd Ed.) Harlen, W. London: Paul Chapman. (2000)

The opening chapters show how children learn, and discuss the nature of the goals of teaching science to children aged 5 - 12. The author provides a theoretical rationale for why science should be taught in particular ways, and ideas and examples of how to do it. A key feature of *Teaching and Learning and Assessing Science 5-12* is the attention given to assessment, particularly assessment that has a formative role in teaching and learning. Research shows that improving formative assessment can raise the standard of children's achievement.

The New Science Literacy: Using Language Skills To Help Students Learn Science. Thier, W. (with Daviss, B.) Portsmouth, NH: Heinemann. (2002)

Thier and Daviss provide clear guidance on linking science and language instruction to simultaneously strengthen students' mastery of both disciplines. Designed for science educators in grades four-through-ten, the manual contains specific strategies, techniques, sample classroom-based activities, and lists of student performance expectations to help educators fuse science and language experiences. The text seeks to enhance all aspects of literacy--reading, writing, speaking, listening, and media analysis--and places language literacy in the context of inquiry-based, activity-oriented science.

Science Workshop: Reading, Writing, and Thinking Like A Scientist (2nd Ed.). Reardon, J., Pearce, C., Dieckman, D. & Neutze, D., Portsmouth, NH: Heinemann. (2002)

Practical suggestions, strategies and materials. Living examples demonstrate how a science workshop fosters authentic inquiry across the curriculum, and supports a classroom where choice and interaction thrive. *Science Workshop* takes inquiry-based science to a level that empowers children to be scientists for the rest of their lives

Teaching Reading in Science. Barton, M. L., & Jordan, D. L. A supplement to teaching reading in the content areas: Teachers Manual (2nd Ed.). Aurora, CO: Mid-continent Research for Education and Learning. (2001)

This publication addresses both general reading skills and those specific skills needed for readers of science text.

The United States Geological Survey (USGS) National Center for Earth Resources Observation and Science: <http://edc.usgs.gov>

The EROS staff manages and distributes archived images to scientists, policy makers, and educators worldwide that use them in the study of natural hazards, environmental change, economic development, and conservation issues. Researchers at EROS also use powerful computer systems to process and analyze satellite data in new ways. Every advance enhances our understanding of the Earth, how it changes over time, and the implications of those changes for people and ecosystems worldwide.

Designing Mathematics or Science Curriculum Programs: A Guide for Using Mathematics and Science Education Standards. National Research Council (NRC). Washington, DC: National Academy Press. (1999)

With the publication of the National Science Education Standards and the National Council of Teachers of Mathematics Curriculum and Evaluation Standards for School Mathematics, a clear set of goals and guidelines for achieving literacy in mathematics and science was established. Designing Mathematics or Science Curriculum Programs has been developed to help state- and district-level education leaders create coherent, multi-year curriculum programs that provide students with opportunities to learn both mathematics and science in a connected and cumulative way throughout their schooling.